

CLAIMS

1. A process of separating/purifying 1, 1, 1, 3, 3-pentafluoropropane in which a mixture comprising at least 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride is subjected to a distillation step so that a distillate is obtained which comprises an azeotropic mixture consisting essentially of 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride and a bottom product is obtained which comprises 1, 1, 1, 3, 3-pentafluoropropane substantially free from hydrogen fluoride.
2. A process of separating/purifying hydrogen fluoride in which a mixture comprising at least 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride is subjected to a distillation step so that a distillate is obtained which comprises an azeotropic mixture consisting essentially of 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride and a bottom product is obtained which comprises hydrogen fluoride substantially free from 1, 1, 1, 3, 3-pentafluoropropane.
3. A process of treating a feed mixture comprising at least 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride, which process comprises the steps of:
- subjecting the feed mixture to a first distillation stage, whereby a first distillate is obtained which comprises an azeotropic mixture consisting essentially of 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride, and a first bottom product is obtained which comprises 1, 1, 1, 3, 3-pentafluoropropane substantially free from hydrogen fluoride when a 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is larger than the

09964364-092301

1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate, or a first bottom product is obtained which comprises hydrogen fluoride substantially free from 1, 1, 1, 3, 3-pentafluoropropane when the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is smaller than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate, and

subjecting the first distillate to a second distillation stage which is operated at a pressure which is different from that of the first distillation stage, whereby

10 a second distillate is obtained which comprises an azeotropic mixture consisting essentially of 1, 1, 1, 3, 3-pentafluoropropane and hydrogen fluoride, and

a second bottom product is obtained which comprises 1, 1, 1, 3, 3-pentafluoropropane substantially free from hydrogen fluoride when the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is larger than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, or a second bottom product is obtained which comprises hydrogen fluoride substantially free from 1, 1, 1, 3, 3-pentafluoropropane when the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

4. The process according to claim 3 wherein the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is larger than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and also larger than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the

09964364-099301

second distillate, and the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

5. The process according to claim 3 wherein the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is smaller than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and also smaller than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is larger than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

6. The process according to claim 3 wherein the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is between the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and the R-1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is larger than the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

7. The process according to claim 3 wherein the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is between the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1, 1, 1, 3, 3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the R-245fa/HF ratio of the second distillate.

8. The process according to claim 4 the first distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the

range between 8 kg/cm²-G and 20 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G.

9. The process according to claim 5 wherein the first distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G, and the
5 second distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G.

10. The process according to claim 6 wherein the first distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 1
10 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G.

11. The process according to claim 7 the first distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G.

15 12. A process of separating/purifying 1, 1, 1, 3, 3-pentafluoropropane and/or hydrogen fluoride wherein any one of the processes claimed in claim 3.

0064364-09301
103250-4954950